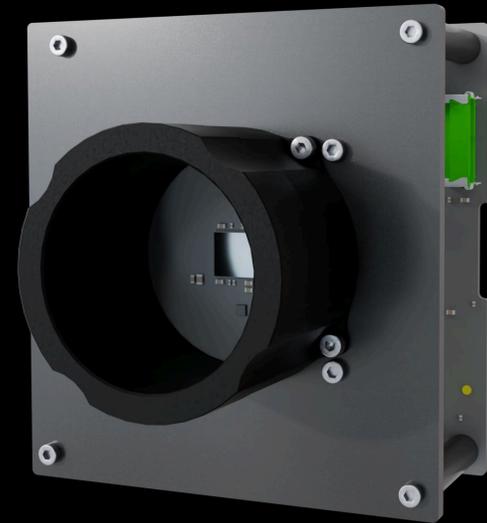


# Helix-100

## High-performance optical payload with multispectral capabilities

The Protostar Labs Helix-100 is a flight-ready optical payload delivering high performance for CubeSat and small satellite missions. Its hybrid architecture combines a powerful FPGA for real-time data processing with a radiation-tolerant MCU for robust system supervision, all within a scalable, modular design for seamless integration.



### Key Features



#### Flexible imaging

Configurable for a wide range of mission needs, supporting Visible (RGB), NIR, and SWIR detectors. The design allows mounting custom optical filters to enable multispectral applications.



#### Hybrid architecture

Onboard FPGA for real-time image acquisition and analytics with a radiation-tolerant MCU for payload system monitoring.



#### Advanced analytics

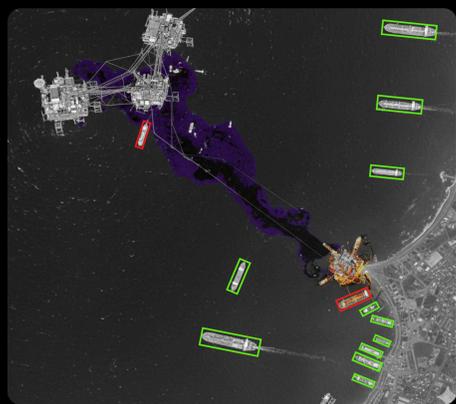
Execute a full image processing pipeline directly in orbit. Our system enables real-time bad-pixel correction, flat-field calibration, lossless/lossy compression, and intelligent ROI extraction to maximize downlink efficiency.



#### Scalable and modular

Our imager system can be adapted to smaller or larger platforms while supporting a wide range of sensor resolutions and optical payload sizes, ensuring a perfect fit for your mission.

### Applications



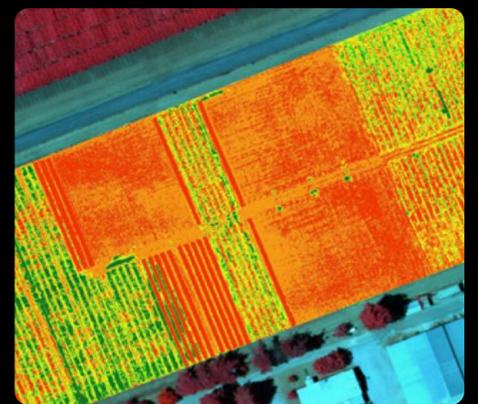
Maritime Surveillance



Infrastructure Monitoring



Environmental Monitoring



Terrain Mapping

### Have a unique mission requirement?

Go beyond off-the-shelf solutions. Our core expertise lies in the end-to-end engineering of custom optical payloads. From optical design and sensor integration to flight-ready hardware, we also build instruments precisely tailored to your mission goals and requirements.

## Technical Specifications

### Optics

Imaging circle	Up to APS-C
Mounting options	C-Mount, M42

### Imaging (Visible light configuration)

Configuration	Snapshot
Sensor technology	CMOS Global Shutter
Resolution	2048x1536
Pixel size	2,2 um
Pixel depth	12 bit
Spectral filter	RGB Bayer Pattern

### On-Board electronics

FPGA	28 nm, 100.00 Logic cells
MCU	Cortex-M7, Radiation-Tolerant, 30kRAD TID
Storage	128 Gigabyte EDAC Protected SLC NAND Flash 16 Megabyte Configuration NOR Flash, up to 3x redundant 512 kB Telemetry MRAM, up to 3x redundant
Image processing	Real-time correction, bad pixel mapping, flat-field calibration, digital TDI
Sensor interfacing	Up to 16x LVDS/SubLVDS/SLVS lanes Up to 6x MIPI CSI-2 lanes Up to 3 sensors
Buffering	DDR3-800, x32
Control interface options	UART, RS-422, SPI, I2C, CAN, SpaceWire
Data interface options	SpaceWire, LVDS
Special interface options	PPS, Clock input
Telemetry	Temperature, current, voltage, events Onboard storage with redundant memory
Power supply	5V (+/- 5%), Wide-range 12-32V
Power consumption	~200 mW – Standby mode ~3.5 W – Ready mode ~8.0 W – Imaging mode

### Mechanical

Dimensions	38.14 mm x 95.88 mm x 90.17 mm
Mass	0.55 (+/- 5%) kg

### Environmental

Operating temperature	-40° to 85 °C
Radiation (TID)	Up to 30 kRad

Ready for collaboration? Contact us at [sales@protostar.ai](mailto:sales@protostar.ai)